

## PROTECTING PASSENGERS.

### HOW THE HALL AUTOMATIC SYSTEM WORKS.

It is Now in Operation as Far as Morristown on the D. L. and W. Between of the Old Block System. The Westinghouse, The Delaware, Lackawanna and Western Railroad Company and the Hall Automatic Signal Company gave an exhibition yesterday of a newly installed block signal system, just put in operation on the railroad. One who was familiar with the methods of running railroads of a generation ago can best appreciate the advance in railroading, which an exhibition such as that of yesterday indicates. In the old days of railroading when the tracks went over single lines of tracks, safety was apparently the result of grace alone. Out of

the chaotic condition of things there gradually grew up a set of rules of the road, which regulated the movements of trains with fair precision until wires were strung alongside of every pair of rails and conductors were assisted by direct telegraphic orders.

It may be noted here that no men ever were so safe and capable in running railroad trains as those who were trained under good management, upon the telegraph wires for three days before the first telegraph wire along the line. Every one of these men knew the comparative rights of freight trains, mixed trains, and passenger trains, and knew also how to protect the rear end of a train which was stalled or delayed through any cause. These were the men who never failed to run back with a red flag or lan-

ten one thousand yards or more if their train happened to be stopped unexpectedly on a main line, or to protect it as they came in, with torpedoes placed on the track.

Many a road that did not have a telegraph line along it, and that never had a bit of protection except such as it got from the book of rules, was able to boast with truth that few accidents of a serious nature had occurred upon it, and that they had never killed a passenger, except through the passenger's fault. As long as railroad traffic was confined to the running of trains at intervals which were long enough apart to let each train have room for its movements, these rules were all that was needed. Pretty soon, however, this was no longer possible. Trains

To meet these conditions, railroad men contrived the additional safeguard among them the block-signal system. The idea was simple. Men were placed in towers along the railroad line, at intervals short enough to see each other's signals, and by means of the movable arms of semaphores they were able to tell what the condition of the track was ahead of them and behind them. If there was a train in the block ahead of them, they kept their signal at caution, or danger, and no engineer was allowed to enter that section of the road, until the train ahead had cleared the block. They were justified by a green signal. This system

was soon supplemented by telegraph wires from station to station, and this furnishes one of the most effective safeguards to-day of modern railroading.

Under this system the operator in one station drops a danger signal, as soon as a train passes into the next station, and the operator in the next station to a halt, and holds the red signal down until the operator at the next station sends him the signal to proceed. This system is very safe, and is in use all over the world.

It is complete, but it is only as perfect as the weakest link in the chain of human intelligence along the line. It is not perfect, because of the terrible accidents of record occurred in spite of it.

A train broke in two in a tunnel in England, and the operator, not noticing the absence of the train, sent another train into the tunnel. The engine and the cars attached to it passed, and a following train, admitted because of his error, ran into the first train, and the result was that seven were killed in the collision and in the wreckage.

Another disadvantage of such a system is its expense. It is estimated that the cost of such a system would be \$100,000 per mile. This is a very frequent interval in the neighborhood of great cities. If the exigencies of travel demand that trains be sent out at intervals of three minutes, these stations must be as close together as the distance represented by the length of a signal men are \$30 to \$50 a month, and to run day and night two men must be employed for each station.

The expense must be great railroad companies would not cavil at it but for one grave question, is human intelligence and attention sufficiently susceptible of purely mechanical appliances? This is a question that has been definitely answered may fairly be inferred, from the fact that none of the big passenger lines in the world have adopted such a system. These arguments to the exclusion of the other

Even the automatic signal men do not feel free to say that the old system of sending back flags is better than the new one. The latter, they believe, should be abandoned because of the adoption of their contrivances.

However, points with pardonable pride to the records of the performances of some of the roads, which have tried their systems of signals. The Hall Company, which has just put into service a new system of signals on the Chicago and Western road as far out as Morris town, has its signals on the suburban section of the Illinois central road, and there were in service during the past year 1,000 signals, 1,000 of which had time the Illinois central road sent out, under the protection of these signals 34,000 local passenger trains and 19,600,000 passengers without an accident.

Of the automatic systems there are but two—the Hall Company and the Westinghouse pneumatic systems. The latter is used by the Chicago and North Western road, and the promoters of each claim certain ad-

signals for their systems. The principle of both systems is alike. The track is divided into sections, each of which is provided with a number of each of these blocks are connected together with copper wires into an electric circuit. The flow of current is controlled by the wheels running on the rails. As long as the wheels follow the road, the resistance is passed around it. So long as this constant current flows, the rate of the current is maintained and the signal discs or arms remain at danger. Now let a train pass into one of these sections. The current circuit is short cut across the wheels and the flow of the train from the battery to the signal local battery is connected, which lifts the signal from danger to clear, and the one behind which has been lifted by an advancing train returns to danger.

In the Hall system this is accomplished by using, as has been designated, a strong secondary battery, the battery of the Westinghouse system the latter work is done

The use of compressed air. In this system the signal electric current works valves in the air pipe which are connected with the air motor contacts, as in the Hall system. It seems to be entirely claimed that the Hall system is less expensive than the compressed air system, but the latter has some circumstances which make it preferable.

Westinghouse has a much greater power available for the moving of its signals.

At the Westinghouse plant at Lawrence, Lock-wanna and Western Road the Hall system worked admirably. The signal stations vary in their distance apart according to the character of the traffic. At Lawrence the distance between two Hoboken and grow more distant as the area for heavy local traffic is passed.

At the Westinghouse plant, each switch is controlled by a magnetic signal, each switch and curve is protected by auxiliary signals, should a train approach a switch it will set the danger signals on the main line, and this will allow the train to pass the switch and then to run down on a siding to a place where

train on the main line might strike them. Another of the important features of the system is that the crossing of the tracks is made by means of a switch. The crossing of track is not set until a train has not only passed out of that block, but not so far into the next block that it would require the stopping of a following train, even if that one should be close behind.

All of these features were made plain yesterday to the visitors who were invited to the plant. The demonstration included many representatives of the railroads running out of Jersey City and New York.

**Bear Shooting in the Adirondacks.**

AMPERMAN, N. Y., Sept. 12.—The hunting season has opened with a rush. Two very large rucks have been shot within sight of the Hotel Impermand, one weighing 248 pounds.

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